Housing, Feminism, Sex Hygiene Movement, Trades Unionism, Prohibition, and the like; Religion and Eugenics; Eugenics and Euthenics.

This book is a thoroly well organized and well-reasoned contribution to a subject of immense importance and timeliness. It is sure to be much used.

Applied Eugenics, by Paul Popenoe and R. H. Johnson, 459 pages. The Macmillan Conpany, 1918.

THE CAUSES AND COURSE OF ORGANIC EVOLUTION

The last few years have seen a revival of interest in the task of furnishing a statement of the problems and progress of general evolution. While perhaps none of these except that of Osborne makes a notably original contribution to this synthesis, no such attempt is ever without great interest to the student of life.

The author of the book under review calls it a "Study in Bioenergics." He says that *energy*, *continuity*, and *evolution* may be considered the triune key-note of the volume. His early chapters have to do with "Ether and Energy in Evolution of Matter," "Relation of Inorganic to Organic Bodies," "Relations and Transformations of Energy," and "Energies of the Organic World."

In the spirit of this idea that evolution is to be conceived primarily as transformations of energy in relation to ether, the author undertakes to arrange an ascending series of energies under the two heads of inorganic (crystalloid) energies and organic (or colloid). Under the former he grades heat, light, chemical activity, and electricity as progressive manifestations, and he deems the physical states of matter—gaseous, liquid, viscous, and solid—as parallel with, and the result of, these progressive transformations in energy. Between the inorganic and organic he conceives a "transition" energy which he calls "duplo-electric." The distinctive organic energies he names biotic, cognitic, cogitic, and spiritic. Parallel with the evolution of these types of energy we have the specialized manifestations of matter in the ascending scale of living objects, as protoplasmic, nuclear-chromatin, and nerve cell substance ("neuratin"). Later in the volume the author gives specific chapters to the discussion of what he conceives to be the essential nature of each of these, their relation to one another and to the "inorganic energies" of heat, light,

chemical affinities and electricity. The author continually uses in this connection a conception like this: the progress in the realization of these energies is marked by increased and "more condensed energy activities." Great ingenuity is shown in correlating these energies, the materials they are associated with, and their various manifestations. On the one hand a tremendous encyclopedic amount of chemical, physical, and biological data are thus correlated; on the other the definiteness of these correlations seem at times naïvely forced and fanciful—and often ponderously worded.

The active causes of organic evolution are mentioned as (1) heredity, (2) Environment; (3) Proenvironment; (4) Selection, and (5) Reproduction. Of these the author regards his "law of proenvironment" as a distinctive contribution. He defines this as the "capacity of organized beings of being stimulated by and then positively growing or moving, in part or in whole, toward an environment that represents the *satisfying resultant* or mean between all of the environal stimuli by which they are surrounded"; "the correlated resultant response by any body to the summated correlation of stimulatory action, that leads to a temporarily satisfied state." So far as the writer can see this "law" is only a roundabout statement of the idea of ontogenetic recapitulation (a form of inheritance), plus a measure of the idea of orthogenesis, and possibly a dash of determinism. It seems to say little more than that responses are really adaptive and that they seem to *satisfy* the organism before the response can actually bring about the adaptation to which the completed response ultimately leads.

Next follow a chapter on the origin of sexuality, three on the evolution of plants, and five on the evolution of animals. The last third of the book is given to a discussion of human evolution, the later chapters being given to a consideration of "Morals as a Factor in Organic Evolution," "Religion as a Factor in Human Evolution," "History of Religious Evolution," "Probable Future Advances in Evolution."

As protoplasm is the material formed by biotic energy and is its avenue of expression; and chromatin the product and vehicle of cognitic energy; and neuratin the foundation of the cogitic energy of the nerve cells—so hypothetical "spiritin" is conceived to be the

material concentrate which is at once the product and the mechanism of "spiritic energy" which inspires those specialized phases of personality which are more social, sacrificial, moral, religious—counsels of perfection—the partial qualities of present men, the prime qualities of the superman.

Idealized and even fantastic as some of the author's restatements and interpretation of the scientific data may seem, the reader is certainly made to feel the writer's sense of *continuity* and inclusiveness of evolution, as well as the remarkable function which imagination must play in any such enterprize of synthesizing and actually including all the higher human states as truly as those more elemental forms of energy of which we usually make so much.

The Causes and Course of Evolution, by J. M. Macfarlane. Pages 875. Illustrated. The Macmillan Company, New York, 1918. Price $4.00.